

## Claims

What is claimed is:

Claim 1. A method of combining a plurality of sub-channels to form a single physical channel, comprising the steps of:

- 5 individually channel coding at least a first and a second sub-channel of the plurality of sub-channels to form respective first and second resulting code symbols;
- merging the first and second resulting code symbols to form a combined set of symbols;
- 10 interleaving the combined set of symbols so that the combined set of symbols can be transmitted over the single physical channel.

Claim 2. The method as set forth in claim 1 comprising the step of concatenation interleaving the combined set of symbols to form a concatenation interleaved set.

Claim 3. The method as set forth in claim 2 comprising the step of inner coding the concatenation interleaved set to form an inner coded set.

Claim 4. The method as set forth in claim 1 comprising the step of extending the combined set of symbols by code symbol repetition to form an extended symbol set.

5       Claim 5. The method as set forth in claim 4 comprising the step of decimating the extended symbol set to attain an allowable quantity of symbols per frame.

10      Claim 6. The method as set forth in claim 1 wherein a third sub-channel of the plurality of sub-channels is individually channel coded to form third resulting code symbols and the third resulting code symbols are combined with the first and second resulting code symbols to form the combined set of symbols.

15      Claim 7. The method as set forth in claim 6 wherein the third sub-channel can be turned “on” and “off” such that: when “on”, the third resulting code symbols are combined with the first and second resulting code symbols to form the combined set of symbols; and

when “off”, the third resulting code symbols are not combined with the first and second resulting code symbols to form the combined set of symbols.

5       Claim 8. The method as set forth in claim 1 comprising the step of transmitting the combined set of symbols over the single physical channel.

10      Claim 9. The method as set forth in claim 8 comprising the step of receiving the combined set of symbols over the single physical channel and separating the combined set into the first and second sub-channels.

15      Claim 10. The method as set forth in claim 1 wherein the sub-channels cannot be separated from the combined set of symbols by logical functions without modulation mechanism knowledge.

18      Claim 11. An apparatus that recovers data transmitted on the first and second sub-channels that have been combined according to the method as set forth in claim 1.

Claim 12. The method as set forth in claim 1 wherein the first sub-channel carries data selected from the group consisting of:

- transmit sector indication information;
- power control indication information;
- 5 fast frame acknowledgment information;
- signal-to-noise ratio (SNR) indication information;
- data rate information; and
- adaptive antenna array information.

10 Claim 13. An apparatus to combine a plurality of sub-channels to form a single physical channel, comprising:

- a first channel coder to individually channel code a first sub-channel of the plurality of sub-channels to form first resulting code symbols;
- a second channel coder to individually channel code a second sub-channel of the plurality of sub-channels to form second resulting code symbols;
- 15 an interleaver to merge the first and second resulting code symbols to form a combined set of symbols and to interleave the combined set of

symbols so that the combined set of symbols can be transmitted over the single physical channel.

Claim 14. The apparatus as set forth in claim 13 comprising a  
5 concatenation interleaver to interleave the combined set of symbols to form  
a concatenation interleaved set.

Claim 15. The apparatus as set forth in claim 14 comprising an inner  
coder to inner code the concatenation interleaved set to form a inner coded  
10 set.

Claim 16. The apparatus as set forth in claim 13 comprising rate  
matching symbol repeater to extend the combined set of symbols by code  
symbol repetition to form an extended symbol set.

15

Claim 17. The apparatus as set forth in claim 16 comprising a  
decimator to decimate the extended symbol set to substantially match an  
allowable quantity of symbols per frame.

Claim 18. The apparatus as set forth in claim 13 comprising a third channel coder to individually channel code a third sub-channel of the plurality of sub-channels to form third resulting code symbols and wherein the third resulting code symbols are combined with the first and second 5 resulting code symbols to form the combined set of symbols.

Claim 19. The apparatus as set forth in claim 18 wherein the third sub-channel can be turned “on” and “off” such that:

when “on”, the third resulting code symbols are combined with the 10 first and second resulting code symbols to form the combined set of symbols; and

when “off”, the third resulting code symbols are not combined with the first and second resulting code symbols to form the combined set of symbols.

15

Claim 20. The apparatus as set forth in claim 13 comprising a transmitter to transmit the combined set of symbols over the single physical channel.